Listing of Claims

1. (currently amended) A method in a computer system for individualizing a heartbeat signal for use as a biometric marker comprising the steps of:

acquiring a plurality of electronic heartbeat signals from an individual in an electronic signal form;

for each electronic heartbeat signal, measuring, a plurality of pre-selected heartbeat waveform features to generate corresponding measurements; and

weighting the pre-selected heartbeat waveform features to provide a different statistical weight for each pre-selected heartbeat waveform feature

~~for each of said features, calculating the measurement's average;~~

~~subtracting the measurement's average from each of the measurements to yield a centroid value;~~

~~calculating a standard deviation of each measurement;~~

~~dividing the centroid value by the standard deviation for each measurement to give a quotient value; and~~

~~calculating the probability of divergence of each measurement using the quotient value in a T-distribution analysis~~.

2. (currently amended) A computer readable storage medium containing instructions for controlling a computer system to individualize a heartbeat electronic signal for use in biometric authentication, by:

acquiring a plurality of electronic heartbeat signals from an individual in an electronic signal form;

for each electronic heartbeat signal, measuring, a plurality of pre-selected heartbeat waveform features to generate corresponding measurements; and

weighting the pre-selected heartbeat waveform features to provide a different statistical weight for each pre-selected heartbeat waveform feature

~~for each of said features, calculating the measurement's average;~~

~~subtracting the measurement's average from each of the measurements to yield a centroid value;~~

~~calculating a standard deviation of each measurement;~~

~~dividing the centroid value by the standard deviation for each measurement to give a quotient value; and~~

~~calculating the probability of divergence of each measurement using the quotient value in a T-distribution analysis.~~

3. (currently amended) The computer readable storage medium of claim 2 where said measurements are made on only one variable per observation.

4. (currently amended) The computer readable storage medium of claim 2 where said measurements are made on two variables per observation.

5. (currently amended) The computer readable storage medium of claim 2 where said measurements are made on a plurality of variables per observation.

6. (withdrawn) A method for individualizing heartbeat waveform comprising the steps of:

capturing and recording a number of heartbeat waveforms;

extracting particular univariate and multivariate features from the waveforms;

individualizing measurements of the univariate and bivariate features of the waveform; and

calculating probabilities for measurements of the univariate and bivariate features.

7. (withdrawn) The method of claim 6 wherein the step of individualizing further comprises the steps of:

subtracting each univariate measurement from the average value of the univariate measurement to yield a centroid;

dividing each centroid by the standard deviation of the univariate feature to yield a quotient;

determining the probability of the quotient using a distribution calculation;

and selecting a threshold minimum probability.

8. (new) The method of claim 1 further comprising:

for each electronic heartbeat signal, measuring an additional pre-selected heartbeat waveform to generate a corresponding additional measurement;

preventing the weighting of the additional pre-selected heartbeat waveform in the statistical analysis.

9. (new) The method of claim 1 further comprising:

individualizing the measurements of the pre-selected heartbeat waveform features; and

calculating probabilities for the measurements.

10. (new) The method of claim 9, wherein individualizing the measurements comprises:

for each pre-selected heartbeat waveform feature, subtracting each corresponding measurement from an average value of the measurements to yield a centroid value,

dividing each centroid value by a standard deviation to yield a quotient value,

determining the probability of the quotient value using a distribution calculation, and

selecting a threshold minimum probability.

11. (new) The method of claim 10, wherein calculating probabilities for the measurements comprises calculating the probability of divergence for each measurement using the quotient value.

12. (new) The method of claim 11, wherein calculating the probability of divergence using the quotient value includes using the quotient value in a T-distribution analysis.

13. (new) The method of claim 1, further comprising:

for each pre-selected heartbeat waveform feature calculating an average of measurements;

subtracting the average from each corresponding measurement to yield a centroid value;

calculating a standard deviation for each pre-selected heartbeat waveform feature;

dividing the corresponding centroid value by the standard deviation for each pre-selected heartbeat waveform feature; and

calculating a probability of divergence for each measurement corresponding to each pre-selected heartbeat waveform feature.

14. (new) The method of claim 13 further comprising:

for each electronic heartbeat signal measuring an additional pre-selected heartbeat waveform to generate a corresponding additional measurement;

preventing the weighting of the additional pre-selected heartbeat waveform in the statistical analysis.

15. (new) The method of claim 1 further comprising, authenticating an individual based on the weighted pre-selected heartbeat waveform features.

16. (new) The method of claim 1, wherein the pre-selected heartbeat waveform features include univariate features of a heartbeat waveform.

17. (new) The method of claim 16, wherein the pre-selected heartbeat waveform features include multivariate features of a heartbeat waveform.

18. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature is a position of the dicrotic notch.

19. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature is the difference between two peak amplitudes.

20. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature is the difference between two peak rate of changes.

21. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature reflects how far the dicrotic notch is from a zero point.

22. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature is an up slope of a maximum peak.

23. (new) The method of claim 1, wherein a pre-selected heartbeat waveform feature is a down slope of a maximum peak.

24. (new) The method of claim 1 further comprising:

for each pre-selected heartbeat waveform feature establishing a threshold probability value; and

wherein the threshold value reflects a desired consistency and selectivity.

25. (new) The computer readable storage medium of claim 2 further comprising:

individualizing the measurements of the pre-selected heartbeat waveform features; and

calculating probabilities for the measurements.

26. (new) The computer readable storage medium of claim 25, wherein individualizing the measurements comprises:

for each pre-selected heartbeat waveform feature, subtracting each corresponding measurement from an average value of the measurements to yield a centroid value,

dividing each centroid value by a standard deviation to yield a quotient value,

determining the probability of the quotient value using a distribution calculation, and

selecting a threshold minimum probability.

27. (new) The computer readable storage medium of claim 26, wherein calculating probabilities for the measurements comprises calculating the probability of divergence for each measurement using the quotient value.

28. (new) The computer readable storage medium of claim 27, wherein calculating the probability of divergence using the quotient value includes using the quotient value in a T-distribution analysis.

29. (new) The computer readable storage medium of claim 2, further comprising:

for each pre-selected heartbeat waveform feature calculating an average of measurements;

subtracting the average from each corresponding measurement to yield a centroid value;

calculating a standard deviation for each pre-selected heartbeat waveform feature;

dividing the corresponding centroid value by the standard deviation for each pre-selected heartbeat waveform feature; and

calculating a probability of divergence for each measurement corresponding to each pre-selected heartbeat waveform feature.

30. (new) The computer readable storage medium of claim 2, further comprising authenticating an individual based on the weighted pre-selected heartbeat waveform features.

31. (new) The computer readable storage medium of claim 2, wherein the pre-selected heartbeat waveform features include univariate features of a heartbeat waveform.

32. (new) The computer readable storage medium of claim 31, wherein the pre-selected heartbeat waveform features include multivariate features of a heartbeat waveform.

33. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature is a position of the dicrotic notch.

34. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature is the difference between two peak amplitudes.

35. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature is the difference between two peak rate of changes.

36. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature reflects how far the dicrotic notch is from a zero point.

37. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature is an up slope of a maximum peak.

38. (new) The computer readable storage medium of claim 2, wherein a pre-selected heartbeat waveform feature is a down slope of a maximum peak.

39. (new) The computer readable storage medium of claim 2, further comprising:

for each pre-selected heartbeat waveform feature establishing a threshold probability value; and

wherein the threshold value reflects a desired consistency and selectivity.

40. (new) The computer readable storage medium of claim 2 further comprising:

for each electronic heartbeat signal measuring an additional pre-selected heartbeat waveform to generate a corresponding additional measurement;

preventing the weighting of the additional pre-selected heartbeat waveform in the statistical analysis.